

STATEMENT OF NICHOLAS A. SABATINI, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION, BEFORE THE SUBCOMMITTEE ON AVIATION, COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, U.S. HOUSE OF REPRESENTATIVES, ON CELL PHONES ON AIRCRAFT: NUISANCE OR NECESSITY.

JULY 14, 2005

Mr. Chairman, Mr. Costello and Members of the Subcommittee:

It is a pleasure to be here this morning to review for the Subcommittee the Federal Aviation Administration (FAA) policy and rules regarding the use of portable electronic devices (PEDs), including cell phones, on aircraft and how those may be affected by a proposed rulemaking by the Federal Communications Commission (FCC) to relax their ban on the use of certain cell phones on aircraft. I welcome the opportunity to appear here today with my colleagues from the FCC, and the Department of Justice (DOJ), to discuss our respective roles and responsibilities, as well as with my colleague from the RTCA, Inc., whose organization has greatly contributed to the understanding of the operational effects of PEDs.

Before providing you with a brief outline of responsibilities, I would like to emphasize at the outset that, regardless of the final outcome of the FCC's proposed rulemaking, the FAA's safety regulations regarding portable electronic devices onboard aircraft will remain in place.

In order to prevent potential interference with aircraft communications and navigation equipment, the FAA has regulations¹ that prohibit the use of portable electronic devices,

¹ See 14 C.F.R. 91.21, 121.306, 125.204, 135.144).

with some limited, specified exceptions, onboard a U.S. air carrier aircraft or any other U.S. registered aircraft operating under instrument flight rules (IFR). The specific exceptions to the rule are for portable voice recorders, hearing aids, heart pacemakers, and electric shavers. Use of those devices is allowed. Our regulation also provides an additional, more general, exception one that is relevant to today's discussion: if an aircraft operator has determined that a portable electronic device will not interfere with the navigation or communication systems of the aircraft on which the PED will be used, the operator may permit use of the PED onboard that aircraft. This general exception sounds deceptively simple, but I assure you it is quite complex in this era where the old cable and pulley flight control systems on many aircraft have been replaced by modern "fly-by-wire" aircraft equipped with analog and digital technology that translate pilot control input to the aircraft control surfaces electronically (wires / circuit boards). These advanced avionics depend on clear signal communications onboard aircraft. Air carriers routinely provide information to the FAA about their electromagnetic studies.

We commissioned a Federal Advisory Committee under the auspices of RTCA, Inc., to study radio frequency emission and interference issues. During the first phase of their study, they issued a report in 1996 as well as procedures for air carriers to use in making a determination about whether a PED interferes with onboard navigation or communication systems. The RTCA is continuing to investigate the use of new technologies onboard aircraft and we expect this phase to extend to the end of next year. My colleague here today will provide more details about their work with not only the FAA, but with the aviation community and the PED industry.

To understand the issues that PEDs pose for the aircraft environment and, therefore, the underlying reason for our safety regulations, one needs to understand the basic problem: electromagnetic interference. All electronic devices send out electromagnetic waves. The power and frequency of these waves depends on the type of device and its physical condition; that is, whether it's been damaged or repaired or "souped up." PEDs can be categorized more simply into two kinds: intentional and unintentional transmitters. Intentional transmitters work by using radio signals to talk or transfer data to another device or service provider. These are devices such as cell phones, two-way pagers, wireless modems, built in WiFi devices², remote control toys, walkie-talkies and many other things. Basically, if the device "talks" to another device without physically being connected by a wire, it is probably an intentional transmitter. *Unintentional* transmitters are all other electronic devices, which include such things as electronic games, laptop computers and Personal Data Assistants (PDAs)—at least the ones that do not use wireless technologies. Unintentional transmitters give off electromagnetic waves whenever they operate. The power level of these waves vary depending on the device and complexity of the device's circuitry.

Modern avionics on aircraft transmit and receive radio signals to communicate with onboard systems, with other aircraft, air traffic control and ground stations. These onboard systems are used for navigation, communication, surveillance, and security and can be affected by the radio signals or electromagnetic waves transmitted intentionally or unintentionally by PEDs. The chance of this occurring is greater with intentional

² For example, an 802.11 ethernet card, or a Bluetooth wireless device, or Blackberry.

transmitters such as cell phones. Additionally, radio signals originating external to an aircraft may combine with signals produced inside the cabin, resulting in a higher probability of interference to the aircraft avionics or flight control systems. To prevent possible interference affecting an aircraft's navigation and communication systems during the critical phases of flight, such as take-off and landing (e.g. when the aircraft is below 10,000 feet), we recommend that air carriers prohibit the operation of any PED (including cell phones) during these times³.

Cell phones are different from other PEDs on aircraft in that they can interfere with the cellular networks on the ground. For this reason, in 1991, the FCC issued a rule that prohibited the use of certain cell phones on aircraft during flight. As I understand it, under the FCC rules, while an air carrier may permit passengers to use their cell phones while an aircraft is on the ground, passengers must turn off their phones once the aircraft has left the gate.

As my colleague will testify this morning, the FCC now believes that, with advances in cell phone technology since 1991, their rule banning 800 MHz cell phone use in flight, may not be needed in order to protect the terrestrial or ground based cellular networks. In February, they published an NPRM that proposed to lift the ban on the use of 800 MHz cell phones while airborne if such phones are operating at their lowest frequency power under control of onboard equipment, e.g. a "pico cell," which is installed on the aircraft and acts as a controller for onboard callers. In this scenario, the pico cell would manage the power levels of the cell phones that would potentially solve the FCC's concern with

³ See the FAA Advisory Circular 91.21-1 that accompanies our safety rule.

interference with ground-based cell phone communications. We are not aware of any current technology that restricts emissions to the confines of the particular aircraft with such an installation.

The FAA and the FCC coordinated closely during the development of the FCC's proposed rulemaking action so that the public would be apprised of our respective roles. The FAA supports the FCC's action in examining these issues and seeking public comment. The NPRM notice clearly notes throughout the document that whatever the outcome of the FCC's proposal, use of cell phones onboard aircraft is still subject to FAA's safety regulation and air carrier policies. This rulemaking action by the FCC has generated substantial public comment, and I will defer to my colleague to review for you the proposal and the status of their action.

What I do want to emphasize is that the FAA is not changing its rules. We will certainly continue to work with the FCC and any other agencies that have roles to play to ensure that the public is well aware of the prerequisites for using cell phones or any other PED while in flight. If an air carrier elects to permit cell phone usage (or other PED) onboard during flight, they must determine that the use of that *particular* model phone won't interfere with the navigation or communication systems onboard the *specific type of* aircraft on which the phone will be used. That's a substantial challenge with ever-changing cell phone technology on the one hand, and, on the other, increasingly advanced and complex aircraft technology as the national airspace system moves to satellite

navigation. The Global Positioning System (GPS) is a critical enabler of new procedures and must be protected from increased background noise as well as direct interference.

The GPS received signal is at a very low level. The proper operation of GPS receivers can be disrupted by a relatively low level signal generated by an undesired signal source. Nevertheless, if an air carrier is willing to take the time and incur the expense of testing and verifying that the cell phone usage presents no in-flight interference problems, our rules allow an air carrier to permit such devices.

Most airlines now prohibit the use of intentional transmitters such as cell phones during flight. However, we have recently worked with a couple of carriers who have allowed the use of PED technology under our rule on certain aircraft. The first instance involved a proposal by American Airlines and Qualcomm for a one-time test in July 2004 of the use of a Qualcomm cell phone onboard a Boeing MD-80 aircraft with a pico cell that was brought on board for the test (i.e. it was not permanently installed on the aircraft). The test was successful in that it provided data for the airline and the cell phone providers to analyze and further study. For example, it showed that the pico cell would control the strength of cell phone emissions but that it would only allow so many people onboard to use their cell phone at any one time due to the capacity limit of the pico cell. In the second instance, last month we approved the installation of equipment that will allow United Airlines and Verizon to permit the use of WiFi wireless internet connection onboard Boeing 757 aircraft during flight after the aircraft reaches cruising altitude. Under this system, a passenger may use a laptop computer or other device with an 802.11 ethernet card to connect to a server onboard the aircraft that directs the communication to

a ground-based internet provider. Using this technology, a passenger could not only surf the internet but could also use a voice-over internet protocol (IP) connection with a headset to make phone calls over the internet. Also, we understand that Airbus, last September, demonstrated an airborne pico cell using the European GSM mobile phone technology on an Airbus A320.

It remains to be seen if carriers will seek approvals for use of more PEDs on other types of aircraft. Should the FCC relax its rule regarding the use of 800 MHz cell phones, it could provide an impetus for air carriers to permit the use of a variety of cell phones (or other PEDs) in flight. If that's the case and if an air carrier has met our safety requirements, the carrier may permit such use, with procedures to help passengers be aware of exactly what phones may be used and under what conditions.

We will also closely monitor what potential effects that wider use of cell phones or other PEDs in flight might have on new satellite navigation procedures and aircraft capabilities to take advantage of such procedures. That means we have to be careful to protect the more advanced onboard technology from harmful interference from PEDs. For example, there is potential that such interference could reduce the number of GPS satellites that an aircraft could "see" and therefore reduce the accuracy of the GPS signal. The FAA takes this into consideration in requirements for the GPS accuracy expected for navigation procedures. The navigation procedures are also designed with missed-approach procedures for alternative navigation capability.

This potential to provide passengers with new communication technologies also raises the issue of what FCC Commissioner Copps refers to as the “annoying-seatmate issue.” This is largely a social issue, albeit one with potential safety implications. Other modes of transportation are also dealing with the issue of cell phone use by passengers. For example, Amtrak designates “quiet cars” for passengers who do not want to be disturbed by cell phones.

We expect that air carriers will have to sort this out, weighing the pros and cons—but inflight cell phone use could also present unique safety and security concerns. DOJ is here today to address the security aspects of this issue. We will continue to work with our colleagues as these issues are examined. What effect in-flight cell phone use may have on pilot workload or interference with a flight attendant’s safety duties due to incidents of passenger “air rage” is an unknown at this point. However, it’s not hard to imagine a scenario where use of cell phones by several passengers in the confined space of an aircraft cabin could lead to conflicts. We are concerned that, should cell phone use be permitted, flight attendants might be distracted from their critical safety duties and responsibilities if they are increasingly required to deal with irate passengers. This will be one of the issues that we will continue to assess and monitor if cell phone technology proliferates onboard aircraft.

Mr. Chairman, I trust this information about our program is helpful. Safety is the FAA’s highest priority and we will continue to enforce and maintain our regulatory oversight on the use of all PEDs, including cell phones, onboard aircraft.

That concludes my testimony. I would be happy to answer any questions that you or the other Members of the Subcommittee may have.